AMENDMENTS TO THE CLAIMS

Please amend Claims 3 and 20.

Please add Claims 21-30.

1. (Original) An integrated circuit comprising a magneto-resistive memory cell, the magneto-resistive memory cell comprising:

a free magnetic layer;

a non-magnetic interlayer, wherein the non-magnetic interlayer comprises a conductor and is in contact with the free magnetic layer;

a pinned magnetic layer, wherein the pinned magnetic layer is in contact with the non-magnetic interlayer; and

an additional pinned magnetic layer, wherein the pinned magnetic layer is between the free magnetic layer and the additional pinned magnetic layer and wherein a magnetization orientation of the pinned magnetic layer is substantially anti-parallel to a magnetization orientation of the additional pinned magnetic layer, wherein a magneto-resistive material comprising the pinned magnetic layer is different from a magneto-resistive material comprising the additional pinned magnetic layer.

2. (Original) The integrated circuit of Claim 1, wherein the pinned magnetic layer and additional pinned magnetic layer have preselected thicknesses such that a magnitude of a magnetic field of the pinned magnetic layer is substantially equal and substantially opposite to a magnitude of an additional magnetic field of the additional pinned magnetic layer.

3. (Currently Amended) The integrated circuit of Claim **[[2]]**1, wherein a first magnitude of an applied magnetic field for switching the magnetization orientation of the free magnetic layer in a first direction is about 75-125 percent of a second magnitude of an applied magnetic field for switching the magnetization orientation of the free magnetic layer in a direction substantially opposite to the first direction.

4. (Original) The integrated circuit of Claim 1, wherein the additional pinned magnetic layer comprises a ferromagnetic material with magnetization orientation pinned by an adjacent layer.

5. (Original) The integrated circuit of Claim 4, wherein the adjacent layer comprises an antiferromagnetic material.

6. (Original) The integrated circuit of Claim 4, wherein the adjacent layer comprises a permanent magnet material.

7. (Original) The integrated circuit of Claim 1, wherein the pinned magnetic layer comprises a permanent magnet.

8. (Original) The integrated circuit of Claim 1, wherein the additional pinned magnetic layer comprises a ferromagnetic material with coercivity sufficiently high such that its magnetization orientation remains fixed in the presence of an applied magnetic field of a magnitude sufficient to switch the magnetization orientation of the free magnetic layer.

9. (Original) The integrated circuit of Claim 1, wherein the pinned magnetic layer and the additional pinned magnetic layer are separated by a separating layer.

10. (Original) The integrated circuit of Claim 9, wherein the separating layer is ruthenium.

11. (Original) The integrated circuit of Claim 1, wherein the nonmagnetic interlayer comprises copper.

12. (Original) The integrated circuit of Claim 11, wherein the magneto-resistive memory cell is formed within a giant magneto-resistive (GMR) memory array.

13. (Original) A method of constructing a magneto-resistive memory cell in an integrated circuit, comprising:

forming a first magnetic layer;

forming a non-magnetic interlayer, wherein the non-magnetic interlayer comprises a conductor;

forming a second magnetic layer without forming another magnetic layer between the first magnetic layer and the second magnetic layer;

forming a first fixed magnetic layer by applying a first magnetic field to fix a magnetization orientation of the first magnetic layer; and

forming a second fixed magnetic layer by applying a second magnetic field to fix a magnetization orientation of the second magnetic layer in an opposite direction from the magnetization orientation of the first magnetic layer, wherein a magnetic material used in forming the first fixed magnetic layer is different from a magnetic material used in forming the second fixed magnetic layer.

14. (Original) The method of Claim 13, wherein a set of ferromagnetic and antiferromagnetic coupling fields of the second fixed magnetic layer balance an additional set of ferromagnetic and antiferromagnetic coupling fields from the first fixed magnetic layer.

15. (Original) The method of Claim 13, wherein the first magnetic layer and the second magnetic layer have substantially the same thickness.

16. (Original) The method of Claim 13, wherein the first magnetic layer and the second magnetic layer are formed sequentially.

17. (Original) The method of Claim 16, wherein the conductor comprises copper.

18. (Original) A memory device comprising a magneto-resistive memory cell, the memory cell comprising:

a free magnetic layer;

a non-magnetic interlayer, wherein the non-magnetic interlayer comprises a conductor and is in contact with the free magnetic layer;

a pinned magnetic layer, wherein the pinned magnetic layer is in contact with the non-magnetic interlayer; and

an additional pinned magnetic layer, wherein the pinned magnetic layer is between the free magnetic layer and the additional pinned magnetic layer and wherein a magnetization orientation of the pinned magnetic layer is substantially anti-parallel to a magnetization orientation of the additional pinned magnetic layer, wherein a first magnitude of an applied magnetic field for switching the magnetization orientation of the free magnetic layer in a first direction is about 75-125 percent of a second magnitude of an applied magnetic field for switching the magnetization orientation of the free magnetic layer in a direction substantially opposite to the first direction, wherein a magneto-resistive material comprising the pinned magnetic layer is different from a magneto-resistive material comprising the additional pinned magnetic layer.

19. (Original) A magneto-resistive memory cell, comprising:

a free magnetic layer;

a non-magnetic interlayer, wherein the non-magnetic interlayer comprises a conductor and is in contact with the free magnetic layer;

a pinned magnetic layer, wherein the pinned magnetic layer is in contact with the non-magnetic interlayer; and

an additional pinned magnetic layer, wherein the pinned magnetic layer is between the free magnetic layer and the additional pinned magnetic layer and wherein a magnetization orientation of the pinned magnetic layer is substantially anti-parallel to a magnetization orientation of the additional pinned magnetic layer, wherein a magneto-resistive material comprising the pinned magnetic layer is different from a magneto-resistive material comprising the additional pinned magnetic layer.

20. (Currently Amended) The magneto-resistive memory cell of Claim [1]19, wherein the pinned magnetic layer and additional pinned magnetic layer have preselected thicknesses such that a magnitude of a magnetic field of the pinned magnetic layer is substantially equal and substantially opposite to a magnitude of an additional magnetic field of the additional pinned magnetic layer.

21. (New) The magneto-resistive memory cell of Claim 19, wherein a first minimum magnitude of an applied magnetic field for switching a magnetization orientation of the free magnetic layer in a first direction is about 75-125 percent of a second minimum magnitude of an applied magnetic field for switching the magnetization orientation of the free magnetic layer in a direction substantially opposite to the first direction.

22. (New) The memory device of Claim 18, wherein a separating layer separates the pinned and additional pinned magnetic layers.

23. (New) The memory device of Claim 22, wherein the separating layer comprises ruthenium.

24. (New) The memory device of Claim 23, wherein the separating layer is 7-9Å thick.

25. (New) The memory device of Claim 18, wherein the magneto-resistive memory cell is located at an intersection of at least two conductors.

26. (New) The memory device of Claim 18, wherein the pinned and the additional pinned magnetic layers are formed of a material chosen from the group consisting of cobalt, iron-cobalt, nickel iron and nickel-iron-cobalt.

27. (New) The memory device of Claim 26, wherein a magnetic orientation of the additional pinned magnetic layer is fixed by a layer of antiferromagnetic material.

28. (New) The memory device of Claim 27, wherein the antiferromagnetic material is chosen from the group consisting of iron-manganese, nickel-manganese, iridium-manganese and platinum-manganese.

29. (New) The memory device of Claim 26, wherein the free magnetic layer is formed of a material chosen from the group consisting of cobalt, iron-cobalt, nickel iron and nickel-iron-cobalt.

30. (New) The memory device of Claim 18, wherein the non-magnetic interlayer comprises copper.